

# APPLYING TERM CONSISTENCY TO AN EQUALITY CONSTRAINED INTERVAL GLOBAL OPTIMIZATION PROBLEM

## ABSTRACT

One embodiment of the present invention provides a system that solves a global optimization problem specified by a function  $f$  and a set of equality constraints  $q_i(\mathbf{x}) = 0$  ( $i=1, \dots, r$ ), wherein  $f$  is a scalar function of a vector  $\mathbf{x} = (x_1, x_2, x_3, \dots, x_n)$ . During operation, the system receives a representation of the function  $f$  and the set of equality constraints and stores the representation in a memory within a computer system. Next, the system performs an interval global optimization process to compute guaranteed bounds on a globally minimum value of the function  $f(\mathbf{x})$  subject to the set of equality constraints. Performing this interval global optimization process involves, applying term consistency to the set of equality constraints over a subbox  $\mathbf{X}$ , and excluding portions of the subbox  $\mathbf{X}$  that violate the set of equality constraints.